

Denver Radium Superfund Site
Denver, Colorado
(Review Date: 9/30/03)

Highlights Since the 2003 5-Year Review

- **GIS mapping project completed in 2005**
 - **Risk assessment re-evaluation completed in 2005 for OU 2 and 3**
 - **Groundwater analytical report for OU 3 completed November 2003**
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Brief Site History: The site consists of more than 65 properties combined into 11 Operable Units (OUs) in Denver. Radium was used for commercial purposes in the early 1900s. Ore processing facilities in Denver provided a domestic source of radium. The radium industry collapsed in the 1920s, leaving numerous locations with radioactive residues. The residues were often used as fill or paving materials, or left in place. The Denver Radium Site was added to the Superfund National Priorities List in 1983. The Colorado Department of Public Health & Environment (CDPHE), EPA and responsible parties worked together on the cleanup.

Cleanup Activities Completed: Cleanup is complete at all of the properties except the Shattuck Chemical Company. Cleanup approaches included:

- Removal of contaminated soil to a permanent disposal site
- Installation of ventilation systems to vent radon gas
- Stabilization and capping in place.

Some wastes under structures and streets were left in place, where they do not pose an unacceptable threat to human health or the environment.

Current Status: Business operations have continued on many of the formerly contaminated properties. Several properties have also been redeveloped. Cleanup continues at the Shattuck Chemical Company as the contaminated soil and monolith are removed and disposed off-site and replaced by clean fill materials.

Summary of Protectiveness: The results of the 5-year review indicate that the remedy for the following OUs has been found protective of human health and the environment: OU1, OU5, OU9A, OU9B, OU10, OU11. The protectiveness of the remedies at the following OUs cannot be determined because the dose exposure limit used in the original Risk Assessment does not meet the current ARAR of CRR 1.007 4.61.3.2-4.61.3.3: OU2, OU3, OU4, OU6, OU7. See Table for update on OU 2 & 3. Because the remedial action is ongoing at OU8 (Shattuck), the protectiveness will be determined once the remedy is complete and operational.

Issues Impacting Protectiveness: A few issues that do not immediately impact the protectiveness of the remedy were noted. The following table summarizes the status of the follow-up actions addressing these issues.

**Denver Radium Superfund Site
Five-Year Review Update Table
(9/30/03)**

Issues	Recommendations/ Follow-up	Follow-up Actions (Status/Due Date)	Status of Follow-up Actions 12/05	Responsible Party
1) Lack of ICs at various properties	Implement a meaningful system of ICs at OU2, OU3, OU6	EPA negotiating agreement with Denver & Department of the Interior (DOI). Expected resolution 12/05	EPA negotiating agreement with Denver & DOI Expected resolution 12/06	EPA and CDPHE
2) GIS database system for IC overlay	Provide locations for waste left in place, remediation features, monitoring points, and OU boundaries	An Internet Mapping Server (IMS) application is under development. Project scheduled to be complete by 12/04	An Internet Mapping Server (IMS) application is under development. Project completed.	EPA & City of Denver
3) Risk assessments do not meet current ARAR requirements	Reassessment of the risks based on the current ARAR standards should be completed for implementation of future ICs	CDPHE will perform reassessment of risk by 9/04	CDPHE will perform reassessment of risk. OU 2 completed 5/05; OU 3 11/05; OUs 4, 6, & 7 pending.	CDPHE
4) OU3 groundwater analytical report needs to be completed	<ul style="list-style-type: none"> - Complete analytical report - Complete an additional round of groundwater monitoring in December 2003 or January 2004. 	<p>The Monitoring Report for the OU3 wells will be submitted by 5/04</p> <p>Sampling to be conducted 2/04</p>	OU3 well reports submitted.	CDPHE

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5) Groundwater monitoring at OU8 needs to be continued	Continue or finalize monitoring	Technical Assistance Agreement with USDOE Contractor to resume monitoring by April 2004	Technical Assistance Agreement with USDOE Contractor on hold due to a lack of funding.	EPA
6) Groundwater analytical report for OU9B needs completing	Complete groundwater analytical report	Submitted 11/13/03	Submitted 11/13/03	CDPHE
7) Groundwater monitoring frequency at OU9	Reduce frequency of monitoring from annually to bi-annually until next 5-year review	New schedule established in 11/03 groundwater monitoring report	New schedule established in 11/03 groundwater monitoring report	EPA & CDPHE
8) Undocumented removal action at OU6	- Complete file search and interviews of participants in this removal action should be conducted	Document search and interviews were completed for the OU6 contamination 12/03	Document search and interviews were completed for the OU6 contamination 12/03	CDPHE
	- If no files are recovered, then based on interviews, a gamma survey should be conducted to re-document site conditions	A gamma survey was conducted in 1/04, remaining contamination was left in place in accordance with area-averaging	A gamma survey was conducted in 1/04, remaining contamination was left in place in accordance with area-averaging	CDPHE